Product Features

Frequency: DC ~ 3GHz

Insertion Loss: 0.3dB@1.2GHz

Isolation: 32.3dB@1.2GHz

Input Power for 1dB Compression:

38.2dBm@1.2GHz

Switching Time: 30ns (ON)

30ns (OFF)

Control Voltage: 0/+3V ~ +8V

Low DC Power Consumption

Package: SOT23-6

Application

Cellular/3G Infrastructure

Dedicated Mobile Wireless Devices

WLAN, WiMAX & WiBro

Automotive Telematics

Test Equipment

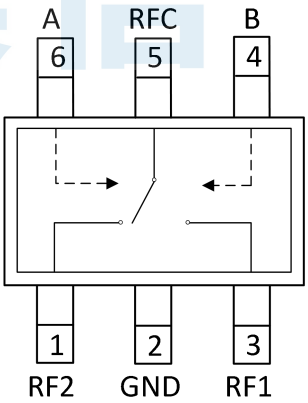
Ordering Information

Part Number	Package	Description
BR9508TD	SOT23-6	DC ~ 3GHz SPDT RF Switch

General Description

The BR9508TD is a single-pole double-throw switch manufactured using GaAs process over the frequency range of DC ~ 3GHz. Typically, the product provides 0.3dB insertion loss. RF1 and RF2 are reflective shorts when “OFF”. On-chip circuitry allows single positive supply operation from +3 Vdc to +8 Vdc at very low DC current with control inputs compatible with CMOS and most TTL logic families. The product features small size, low insertion loss, high isolation, fast switching speed and low DC power consumption for IF and RF switching application.

Functional Block Diagram



Electrical Specifications

Parameters	Test Conditions		Min.	Typ.	Max.	Units
Insertion Loss	0.001GHz to 1.0GHz		—	-0.2	—	dB
	1.0GHz to 3.0GHz		—	-0.4	—	dB
Isolation	0.001GHz to 1.0GHz		—	-40.1	—	dB
	1.0GHz to 3.0GHz		—	-31.4	—	dB
Return Loss	0.001GHz to 1.0GHz		—	-27.9	—	dB
	1.0GHz to 3.0GHz		—	-29.1	—	dB
Input Power for 1 dB Compression	0.6GHz to 2.5GHz	V_{ctl}=0/+3V	31.9	33.5	—	dBm
		V_{ctl}=0/+5V	36.3	38.3	—	
		V_{ctl}=0/+8V	38.1	39.5	—	
Switching Characteristics						
t_{RISE}, t_{FALL} (10/90% RF)	0.001GHz to 3.0GHz		—	30	—	ns
t_{ON}, t_{OFF} (50% CTL-10/90% RF)	Pin=0dBm		—	30	—	ns
Test Conditions: Vctl=0/+5V, Temp=+25 ° C						

Absolute Maximum Ratings

Maximum RF input Power: 38dBm@8V@25 °C

Control Voltage Range: -0.2V ~ 12V

Recommended Operating Conditions

Control Voltage: 0V/+3V ~ +8V

Operating Temperature: -55℃ ~ +125℃

Storage Temperature: -65℃ ~ +150℃

Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

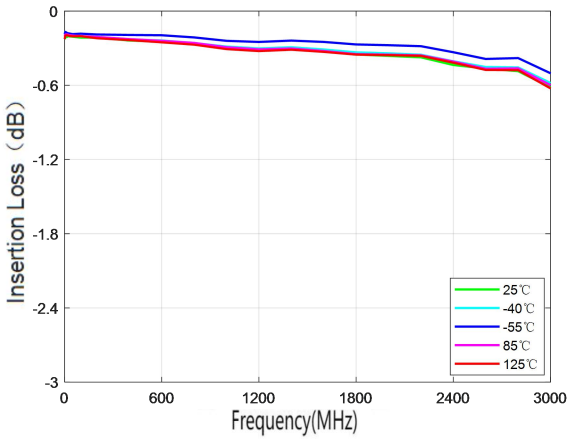
ESD WARNING

ELECTROSTATIC SENSITIVE DEVICE

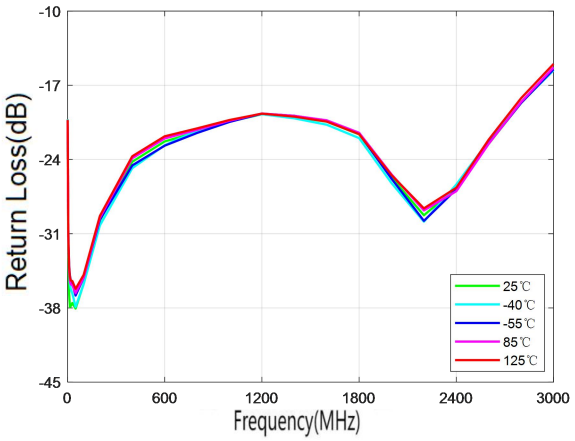
OBSERVE HANDLING PRECAUTIONS

Typical Performance(EVB Testing)

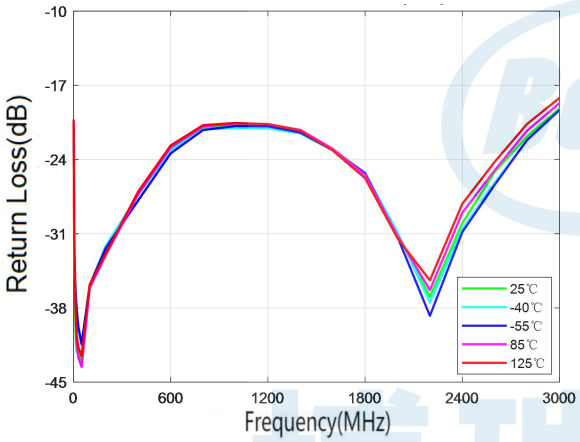
Parameter	Typ.											Units
Frequency	1	5	10	15	30	50	100	200	400	600	800	MHz
Return Loss (RFC)	-21.4	-33.2	-36.6	-37.9	-37.5	-38.1	-35.7	-29.8	-24.2	-22.3	-21.4	dB
Return Loss (RF1/RF2)	-21.4	-33.7	-38.2	-41.1	-42.4	-42.9	-36.2	-32.6	-27.3	-23.0	-21.1	dB
Insertion loss	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	dB
Isolation (RFC to RF1/RF2)	-65.5	-66.3	-61.1	-56.4	-54.1	-51.2	-46.4	-39.5	-34.6	-33.2	-32.0	dB
Isolation (RF1 to RF2)	-67.7	-67.2	-61.6	-56.8	-54.7	-51.9	-46.7	-39.7	-35.3	-34.1	-33.4	dB
Input Power for 1dB Compression	-	-	-	-	-	-	-	-	-	36.3	36.9	dBm
Frequency	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	MHz
Return Loss (RFC)	-20.4	-19.7	-20.0	-20.4	-21.6	-25.7	-29.3	-26.7	-22.5	-18.6	-15.5	dB
Return Loss (RF1/RF2)	-20.7	-20.8	-21.3	-23.0	-25.3	-30.9	-36.9	-30.0	-25.2	-21.8	-19.2	dB
Insertion loss	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.6	dB
Isolation (RFC to RF1/RF2)	-32.3	-32.3	-30.5	-29.4	-28.7	-26.5	-24.9	-24.0	-22.6	-21.1	-20.9	dB
Isolation (RF1 to RF2)	-34.9	-36.4	-37.3	-38.4	-36.4	-33.9	-30.8	-27.5	-25.7	-24.2	-21.9	dB
Input Power for 1dB Compression	37.4	38.2	37.6	39.2	39.4	38.0	37.9	38.5	-	-	-	dBm
Switching time	30ns rise switch						30ns down switch					ns
Test Conditions: V_{ctl}=0/+5V, Temp=+25 ° C												



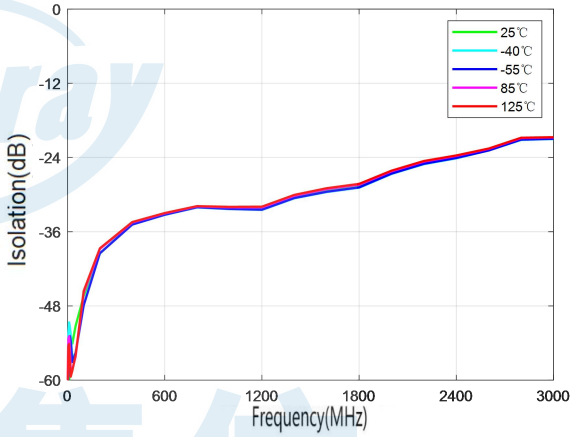
Insertion Loss RFC and RF1/RF2



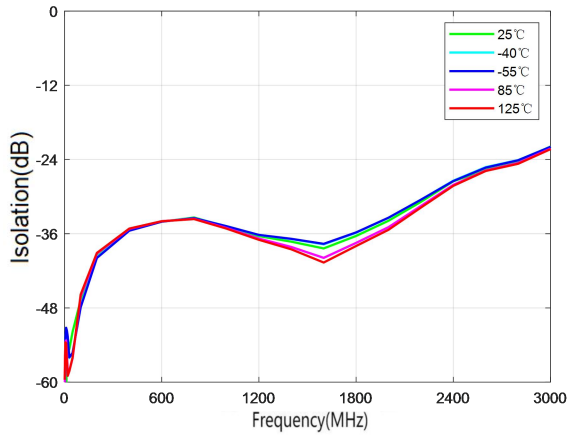
RFC Return Loss



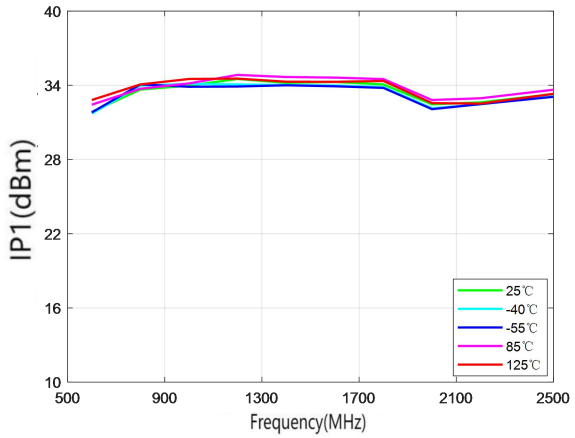
RF1/RF2 On Status Return Loss



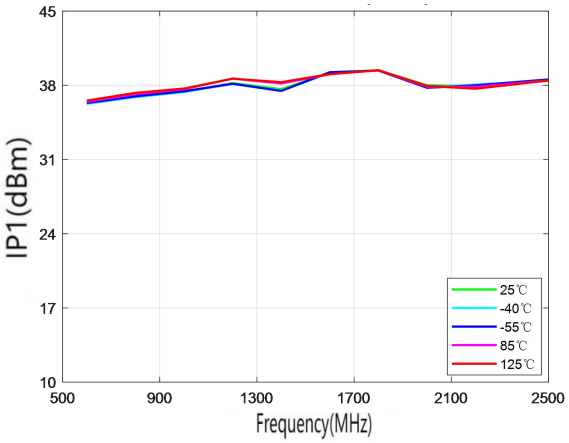
Isolation Degree Between RFC and RF1/RF2



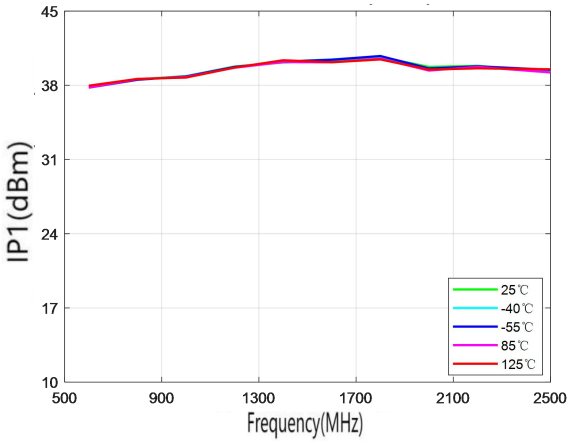
Isolation Of RF1 from RF2



Input Power for 1dB Compression(+3V V_{dd})

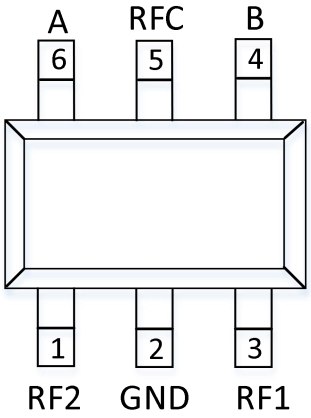


Input Power for 1dB Compression(+5V V_{dd})



Input Power for 1dB Compression(+8V V_{dd})

Pin Configuration and Description

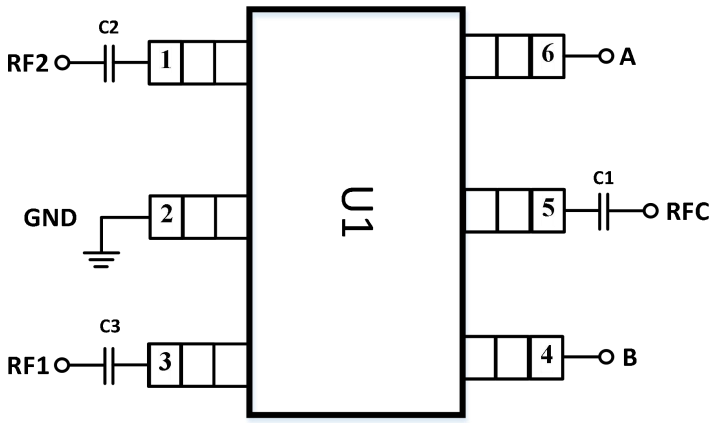


Pin Number	Pin Name	Description
1	RF2	RF pins. DC Block is required.
3	RF1	
5	RFC	
2	GND	RF/DC ground pin. Connect to RF/DC ground
4	B	Control pins, See truth table.
6	A	

Trueth Table

Control Input		Signal Path State	
A	B	RFC to RF1	RFC to RF2
High	Low	OFF	ON
Low	High	ON	OFF

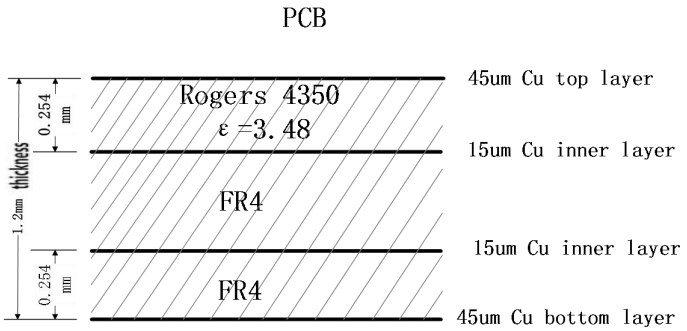
Typical Application Schematic



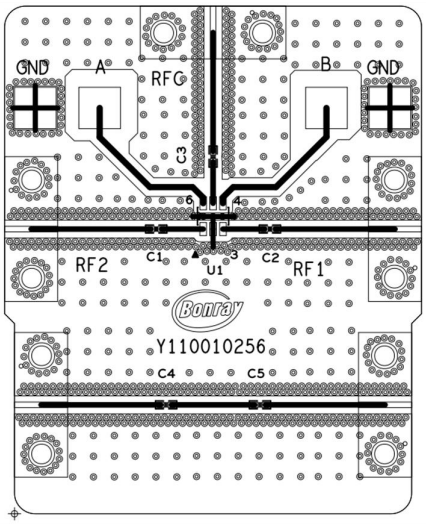
Bill of Material

Designator	Package	Description	Part Number
C1, C2, C3	0402	0.1uF	GRM1555R71H104KE14D

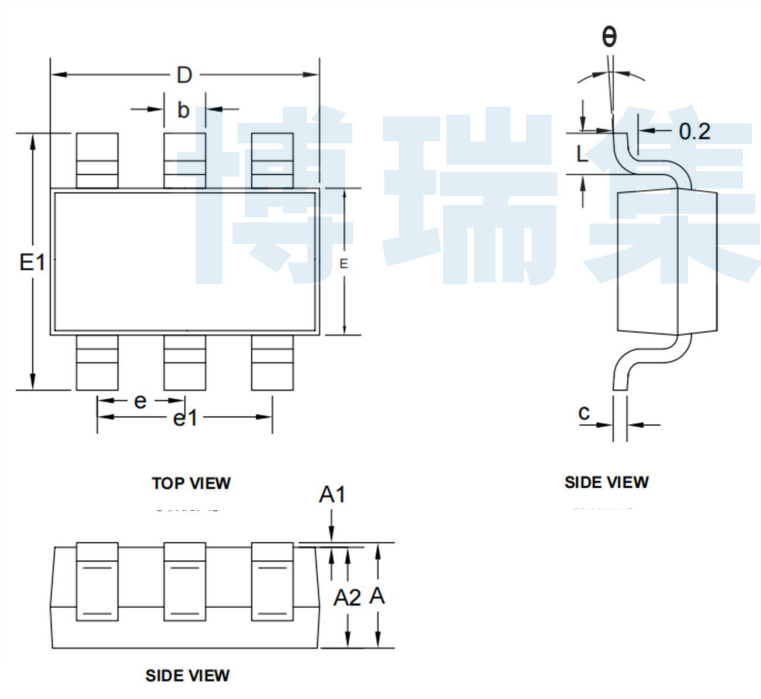
PCB Evaluation Board



50 ohms Impedance Signal Lines：width=0.52mm, spacing=0.52mm



Package Dimensions (mm)



Numbering	Size (mm)		
	Min	TYP	Max
A	1.050	1.150	1.250
A1	0.000	0.050	0.100
A2	1.050	1.100	1.150
b	0.300	0.400	0.500
c	0.100	0.150	0.200
D	2.820	2.920	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
e	0.950BSC		
e1	1.800	1.900	2.000
L	0.300	0.450	0.600
θ	0°	4°	8°